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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,803	06/11/2001	Min Ho Jung	30205/37328	3762

4743 7590 10/28/2003

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EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/878,803

Applicant(s)

JUNG ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 6-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

This is written in reference to application number 09/878803 filed on June 11, 2001 and published as US 2002/0022197 on February 21, 2002.

Response to Amendment

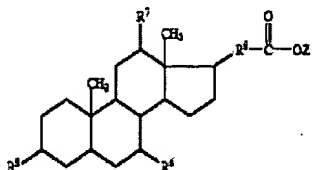
1. Claims 2, 4-5 and 13-20 have been cancelled. Claims 1, 3 and 6-12 are currently pending.
2. The amendment to claim 7 is sufficient to overcome the claim objection set forth in the previous office action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajita et al. (US 6,180,316 B1). Kajita teaches a second embodiment wherein a radiation sensitive resin composition comprises (A') a polymer containing recurring unit (I) of formula (1), (B') a photoacid generator, and (C') an androstane-17-carboxylic acid ester compound of



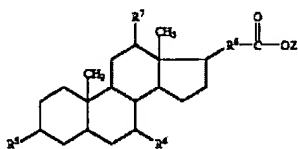
formula 5:

(c. 4, l. 10-45). The said polymer (A') can possess the

acid decomposable group (i) as the substitution groups A and/or B in the recurring unit (I)

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and one or more "other recurring unit". The said polymer may also contain at least one recurring unit selected from a recurring unit obtained by the cleavage of a polymerizable carbon-carbon double bond of norbornene or norbornene derivative (c. 24, l. 24-65). Acid generators, which are particularly preferable, include diphenyliodonium trifluoromethanesulfonate (triflate), triphenylsulfonium trifluoromethanesulfonate and dimethyl (2-oxocyclohexyl) sulfonium trifluoromethanesulfonate (c. 25, l. 45-49; c. 18, l. 57-c. 19, l. 10). To optimize and balance sensitivity and developability as a resist, the amount of the acid generator (B') used in the composition of the second invention is usually from 0.1 to 10 parts by weight of the polymer (A') (c. 25, l. 60-c. 26, l. 2). The compound (C') is a compound of



formula (5):

wherein R^{5-7} is preferably of the groups methoxy, ethoxy,

methyl carbonyloxy, trifluoromethyl carbonyloxy, trichloromethyl carbonyloxy, and tribromomethyl carbonyloxy. A hydrogen atom or hydroxyl group is particularly preferred as the groups R^{5-7} in formula (5) (c. 26, l. 36-41). The ideal example of the divalent organic group represented by R^8 is $-\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2-$ (c. 26, l. 52-55). When the Z group of the said androstane compound (C') has an oxygen atom and an acid decomposable group, the said acid decomposable group dissociates by exposure to radiation and produces a polar group. This provides the radiation sensitive resin composition with polarity, which results in improvement in developing properties and increases adhesion to substrates (c. 6, l. 59-65). Particularly preferably groups for Z are t-butyoxycarbonylmethyl, 2-ethoxyethyl, 2-cyclohexyloxyethyl, 3-oxocyclohexyl, tetrahydropyranyl, and 2-oxo-4-methyl-4-

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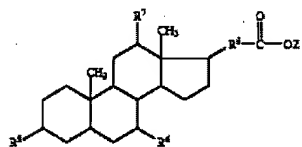
tetrahydropyranyl (c. 27, l. 51-55). The amount of androstane compounds used in the composition is usually from 5-50 parts by weight for 100 parts by weight of the polymer (A') (c. 28, l. 12-19). The resin composition is prepared by dissolving the solid components in a suitable solvent. Particularly preferred solvents include cyclic ketones, linear ketones, propylene glycol monoalkyl ester acetates and alkyl 2-hydroxypropionates (c. 28, l. 20-26; c. 23, l. 2-4; c. 22, l. 21-67). The taught composition is applied to a substrate, pre-baked, exposed, post-exposure baked, and developed (c. 28, l. 20-26; c. 23, l. 18-c. 24, l. 21). It is the examiner's position that when R⁵ is methyl carbonyloxy; R⁶ and R⁷ are hydrogen; R⁸ is -CH(CH₃)CH₂CH₂- and Z is 2-ethoxyethyl, the limitations of claimed formula 3 are met. Further when R⁵ and R⁷ are methyl carbonyloxy; R⁶ is hydrogen; R⁸ is -CH(CH₃)CH₂CH₂- and Z is 2-ethoxyethyl, the limitations of claimed formula 5 are met. The limitations of claimed formula 7 are met when R⁵⁻⁷ are methyl carbonyloxy; R⁸ is -CH(CH₃)CH₂CH₂- and Z is 2-ethoxyethyl.

Kajita fails to anticipate the claimed invention because of the vast number of choices for the R⁵-R⁸. However, one of ordinary skill in the art would have been motivated by the teaching of Kajita to develop a composition comprising a photoresist polymer (A'), a photoacid generator (B') and an androstane compound (C') of formula (5) wherein the R⁵⁻⁷ is preferably H, OH, or C1-2 alkyl carbonyloxy group such as methyl carbonyloxy, R⁸ is ideally -CH(CH₃)CH₂CH₂- and Z is the particularly preferred group 2-ethoxyethyl in order to obtain a radiation sensitive composition which is sensitive to deep UV, exhibits high transparency, high resolution and has excellent property balance such as pattern configuration and sensitivity (c. 2, l. 60-67).

Response to Arguments

5. Applicants have amended the claims to delete the choice of formula (2). The said amendment is sufficient to overcome the rejections over Allen et al. (US 5,580,694 A) and Jung et al. (US 6,391,518 B1) in view of Allen et al. (US 5,580,694 A). The said rejections are hereby withdrawn.

6. Applicants have failed to provide arguments in regard to the rejection of the claims over Kajita et al. (US 6,180,316 B1) as set forth in the previous office action (see paper no. 8, paragraph 13). The present amendment to the claims fails to overcome the rejection over Kajita, which teaches an androstane compound (C') compound (of formula (5):



wherein R⁵⁻⁷ is preferably of the groups methoxy, ethoxy, methyl carbonyloxy, trifluoromethyl carbonyloxy, trichloromethyl carbonyloxy, and tribromomethyl carbonyloxy. A hydrogen atom or hydroxyl group is particularly preferred as the groups R⁵⁻⁷ in formula (5) (c. 26, l. 36-41). The ideal example of the divalent organic group represented by R⁸ is -CH(CH₃)CH₂CH₂- (c. 26, l. 52-55). When the Z group of the said androstane compound (C') has an oxygen atom and an acid decomposable group, the said acid decomposable group dissociates by exposure to radiation and produces a polar group. Particularly preferably groups for Z are t-butyoxycarbonylmethyl, 2-ethoxyethyl, 2-cyclohexyloxyethyl, 3-oxocyclohexyl, tetrahydropyranyl, and 2-oxo-4-methyl-4-tetrahydropyranyl (c. 27, l. 51-55). The amount of androstane compounds used in the composition is usually from 5-50 parts by weight for 100 parts by weight of the polymer (A')

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(c. 28, l. 12-19). It is the examiner's position that when R⁵ is methyl carbonyloxy; R⁶ and R⁷ are hydrogen; R⁸ is -CH(CH₃)CH₂CH₂- and Z is 2-ethoxyethyl, the limitations of claimed formula 3 are met.

7. The examiner maintains the rejection of the instant claims over Kajita as discussed above.

Allowable Subject Matter

8. Claims 6-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: the prior art reference to Kajita fails to teach and/or suggest a polymer having the repeating units represented in claims 6 and 7 having the claimed molar ratio.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.


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In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

14. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

ycf 
October 22, 2003


JANET BAXTER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700